

FORMATION OF E CHONDRITES

D.W. Sears*, *Department of Metallurgy, University of Manchester, Manchester, U.K.*

**Department of Physics, University of Birmingham, Birmingham B15 2TT, U.K. (present address)*

A review has been made of the various condensation and accretion models for the formation of E chondrites. There is no simple equilibrium process which can explain all their fundamental properties. The nearest would seem to involve a complex accretion history, whereby metal and silicates which ceased to equilibrate at high temperatures and pressures (say greater than 10^{-2} atmospheres and about 1500 K) were mixed with material which ceased to equilibrate at the same pressures but over the temperature range 600-700 K. In this way the level of reduction and fractionation of several major, minor and trace elements may be explained. This model is similar to that proposed by Larimer and Anders (1967) in that high and low temperature phases are involved, but differs: (i) in the nature of the high temperature phase, (ii) the pressure required, and (iii) in not needing a nebula of non-solar composition to obtain the level of reduction. Models involving metamorphism cannot achieve the required level of reduction without losing sulphur and volatile trace elements. The only way to avoid a complex accretion process would be to invoke non-equilibrium processes, or a nebula of non-solar composition.